

## Association between Exclusive Breastfeeding and Child Development

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### Abstract

**Background:** Child development highly correlates with child's quality. The fastest child development period is during the first three years, also called golden period. This research was aimed to discover correlation between exclusive breastfeeding and child development in Cipacing Village Jatinangor, district of Sumedang.

**Methods:** This research was conducted using cross-sectional method in thirteen Pos Pelayanan Terpadu (Posyandu) Cipacing Village in Jatinangor. One hundred and two children aged 12–24 months with their caregiver were recruited as respondents by using cluster sampling method. History of exclusive breastfeeding was assessed with questionnaire while child development status was assessed with Kuesioner Pra Skrining Perkembangan (KPSP) in September 2013 after informed consent was obtained. Chi-square test analysis was performed to determine correlation between exclusive breastfeeding and child development status.

**Results:** Overall, children in Cipacing Village had non-exclusive breastfeeding history (83.3%), and only 16.7% respondents had exclusive breastfeeding history. Meanwhile, 89.2% of children had normal development status, and 10.8% had delayed development status. Statistic analysis using chi-square test in the level of 95% confidence between exclusive breastfeeding and child development showed  $p=0.686$  and odds ratio 2.133.

**Conclusions:** There is no significant relationship between history of exclusive breastfeeding and child development status. [AMJ.2016;3(1):79–84]

**Keywords:** Child development, exclusive breastfeeding, one year old children

### Introduction

Development is a result from interaction between matured central nervous system and effected organs, biological changes to control gross and fine muscles, psychological changes in sosial relationship, language, and personality.<sup>1</sup> Delayed in this aspect indicates developmental delay on children, that is still a problem in developing country, especially Indonesia. World Health Organization (WHO) in 2007 recorded that more than two hundreds million children in developing country did not reach complete development,<sup>2</sup> while in Indonesia about 12.8–28.5% children had delayed development.<sup>3</sup> The only food source with complete nutrients that needed by children until six months is mother's breastmilk. Nutrient deficiency on children under two years old may reduce brain cells about 15–20%,<sup>4</sup> disruption in

brain cell maturation processes, interrupted nerve interaction for development process, such as physcomotoric, cognitive and sosial behavior. In Indonesia only 15.3% infants get exclusive breastfeeding.<sup>5</sup> A survey on exclusive breastfeeding by World Breastfeeding Trends Initiative (WBTi) on March 2012, Indonesia ranked 3 of 81 countries.<sup>2</sup> Locally, prevalence exclusive breastfeeding in 2012 based on data in Pusat Kesehatan Masyarakat (Puskesmas) Jatinangor is only 1.3%.

A case control research conducted in Lowokharu, Malang<sup>6</sup> in 2007, stated that there was no difference in developmental status among children aged 1–2 years old with or without exclusive breastfeeding. Contrast to a prospective cohort study in Krakow, Poland<sup>7</sup> in 2011, that showed exclusive breastfeeding in early infancy improve cognitive children development. In accordance to explanation above, this research was aimed to discover correlation between exclusive breastfeeding

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and 12–24 months children development in Cipacing, Jatinangor.

## Methods

This was a cross-sectional research conducted in Pos Pelayanan Terpadu (Posyandu) Cipacing Village, Jatinangor, in September 2013. After ethical clearance was approved by Health Research Ethics Committee, thirteen Posyandu were chosen from eighteen Posyandu in Cipacing Village. Samples were obtained by cluster sampling. Total respondents in this study were 102 children included their mother or caregiver. Inclusion criteria was children aged one years old that registered in Posyandu, Cipacing Village, with complete gestational age or birth weight >2500 grams, without congenital abnormality and chronic disease. Meanwhile, children without caregiver's permission or ill children when data collection were excluded.

After caregivers were explained and understood about informed consent, they should sign the form. The instruments were validated questionnaires for exclusive breastfeeding history and Kuesioner Pra Skrining Perkembangan (KPSP) questionnaire for children development. Caregivers would answer five questions for children history of breastfeeding and Makanan Pendamping ASI (MP-ASI) then children development status was observed using KPSP questionnaire. Four

aspects assessed were gross motors, fine motors, language, and social behavior.

After scoring KPSP scores, developmental status was divided into two groups, normal development (KPSP score nine to ten) and delayed development. Delayed development itself was divided into suspect developmental delay for KPSP score seven to eight and delayed development for KPSP score equal or less than six. The collected data were analyzed by using chi-square test to discover correlation between exclusive breastfeeding and children developmental status

## Results

Most mother's age were ranged in 24–34 years old (52%), more than half of them did not complete senior high school (59.8%), and there were 74.5% respondents come from upper middle socioeconomic status based on the regional minimum wage (Upah Minimum Regional/UMR) of Sumedang. Most of the mothers work as housewives (87.3%) (Table 1).

According to gender of children, it was found that boys are more than girls about 57.8%. Children with age group 12–17 months have highest percentage (60.2%) than other age ranges. There were 55.9% respondents who had siblings (Table 2).

Children in Cipacing Village had non-exclusive breastfeeding history (83.3%),

**Table 1 Maternal Characteristics**

Variable	Frequency	Percentage (%)
Maternal Age (years old)		
15–24	28	27.5
25–34	53	52
≥35	21	20.6
Mother's Education Level		
<senior high school	61	59.8
≥senior high school	41	40.2
Occupation		
Housewife	89	87.3
Work	13	12.7
Socioeconomic status		
Below UMR	26	25.5
Upper middle UMR	76	74.5

Note: UMR= Upah Minimum Regional/ Regional Minimum Wage. UMR of Sumedang District Rp 1.300.000,-/month

**Table 2 Characteristics of Children**

Variable	Frequency	Percentage (%)
Sex		
Boy	59	57.8
Girl	43	42.2
Children ages (month)		
12–17	62	60.2
18–24	40	39.2
Number of Sibling		
none	45	44.1
≥2	57	55.9
IMD		
Yes	82	80.4
No	20	19.6
MP-ASI		
Appropriate by age	89	87.3
Not appropriate by age	13	12.7
Head Circumference		
Appropriate by age	87	85.3
Not appropriate by age	15	14.7

Note: IMD= *Inisiasi Menyusu Dini*/Early Initiation of Breastfeeding, MP-ASI= *Makanan Pendamping ASI*/Weaning Food

and only 16.7% respondents had exclusive breastfeeding history. Meanwhile, 89.2% of children had normal development status, and 10.8% had delayed development status. Statistic analysis using chi-square test in the level of 95% confidence between exclusive breastfeeding and child development showed  $p=0.686$  and odds ratio 2.133 (Table 3).

There are misconceptions on information about breastfeeding for children under six months old. Thus, misconceptions arise from local belief when their child cries, it means that breastmilk is not enough. Some mothers complained that there was no breastmilk is produced, that may be caused by wrong

breastfeeding technique, and others got recommendation from medical staffs nearby that combining breastmilk and formula milk even before six months were good for children nutritional status.

Based on maternal age groups, the highest developmental delay are mothers in aged range 15–24 years old (45.5%). Statistically, there was no correlation between a mother's age and the child's development. (Table 4,5)

The occupational status of mothers showed no significant relationship ( $p=0.35$ ) because all children with developmental disorders came from housewives who do not work. Number of sibling's respondents

**Table 3 Correlation between Exclusive Breastfeeding and Developmental Status**

Exclusive Breastfeeding	Child Development		Total n(%)	p	OR
	Good n(%)	Delayed n(%)			
No	75(88.2 %)	10 (11.8%)	85(83.3%)	0.686	2.133
Exclusive	16 (94.1%)	1 (5.9%)	17(16.7%)		
Total	91 (89.2%)	11(10.8%)			

Note: OR= odds ratio

**Table 4 Correlation between Developmental Status and Maternal Characteristics**

Variable	Child Development		p	OR
	Good	Delayed		
Maternal Age (year)				
15-24	23	5	0.201	
25-34	50	3		
≥35	18	3		
Mother's Education Level				
<senior high school	54	7	1	1.199
≥senior high school	37	4		
Occupation				
Housewife	78	11	0.351	1.167
Work	13	0		
Socioeconomic status				
Below UMR	22	4	0.465	1.331
Upper middle UMR	69	7		

Note: OR= odds ratio, UMR= Upah Minimum Regional/ Regional Minimum Wage. UMR of Sumedang District Rp 1.300.000,-/month

showed no correlation with the child's developmental status (p=1). Weaning food feeding also showed no relationship with

child's development. Therefore, none of the characteristics have a significant relationship with child development.

**Table 5 Correlation between Developmental Status and Characteristics of Children**

Variable	Child Development		p	OR
	Good	Delayed		
Sex				
Boy	52	7	0.757	1.313
Girl	39	4		
Children ages (month)				
12-17	53	9	0.194	3.22
18-24	38	2		
Number of Sibling				
none	40	5	1	1.063
≥2	51	6		
EarIMD				
Yes	73	9	1	0.901
No	18	2		
MP-ASI				
Appropriate by age	81	8	0.146	0.329
Not appropriate by age	10	3		
Head Circumference				
Appropriate by age	77	10	1	0.55
Not appropriate by age	14	1		

Note: OR= odds ratio, IMD= Inisiasi Menyusu Dini/ Early Initiation of Breastfeeding, MP-ASI= Makanan Pendamping ASI/Weaning Food

## Discussion

Golden period is the most important phase for child development. Developmental disturbance in this phase affects worse than other period of time. Basic needs for child development includes care, affection, and stimulation. While, development itself depends on many factors such as nutrition, health, genetic, race, and sex. There are internal factor and external factor. The internal factor consists of nutrition, endocrine, immunological, maternal psychology, radiation and infection, while the external factor is chemical.<sup>1</sup>

In the development, brain cell grows continuously until three years old,<sup>4</sup> therefore besides exclusive breastfeeding, early initiation of breastfeeding and weaning food were assessed in this research to exclude the possibility of confounding factor that might arise.<sup>8</sup>

Maternal breastmilk is the main nutrient for equal or less than six month old infant, and it was suggested to be continued until two years old. It is rich source of fatty acids and other bioactive components essential for the infant brain development. The breastmilk also contains docosahexaenoic acid and arachidonic acid that is not contained in cow's milk.<sup>7</sup> Related to other studies that revealed infant who were breastfeed exclusively had better score in cognitive development test than non-exclusively breastfeed infants.<sup>9</sup>

In this study, children with good development at the first year in exclusive breastfeeding group were 94.1% and in non-exclusive breastfeeding group were 88.2%. Children with delayed development were higher in non-exclusive breastfeeding group (11.8%). Therefore, no correlation found between exclusive breastfeeding and child's developmental status ( $p=0.686$ ). It was similar to the previous research that showed no significant correlation between exclusive breastfeeding and child's developmental status, but there were higher risk possibilities of developmental disorders for non-exclusive breastfeeding infant than exclusive breastfeed infant.<sup>4,6,7</sup> The correlation strength parameter used to determine risk estimate in this research is odds ratio,<sup>10</sup> which generates value about 2.133. The value was meant that the children with non-exclusive breastfeed had 2.133 times more risk for developmental delay than exclusive breastfeeding child.

The percentage of developmental delays on children in Cipacing was slightly lower (16.7%) than the average of Indonesia developmental

delays on children.<sup>3</sup>

Based on maternal age groups, the highest developmental delay are mothers in aged range 15–24 years old (45.5%). Nevertheless, most mother's age were ranged in 24–34 years old (52%), this result was in accordance with the age of pregnancy and childbirth in Indonesia.<sup>11</sup> However, there was no correlation between a mother's age and the child's development, but mothers who have children less than 20 years old have a higher risk for having children with disorder and psychological health.<sup>7</sup>

Maternal education is a significant predictor of child care. The education gives mothers more knowledge about what is needed for their children such as prenatal care, nutrition prenatal and postnatal, development stimulus, authoritative parenting, positive mother-child, and parental management that is important for child development.<sup>12</sup> In this study, more than half of the mothers did not complete the nine years study program (59.8%), this data shows poor rate of maternal education in Cipacing.

Most of the mothers work as housewives (87.3%). A profession as a housewife spends more time at home that gives more opportunity for interacting and caring their children, so her expectation provide a good stimulus for child development.<sup>13</sup>

According to socioeconomic status, there were 74.5% respondents come from upper middle socioeconomic status based on the regional minimum wage (Upah Minimum Regional/UMR) of Sumedang, the recent study showed that socioeconomic families were the external factors that could affect a child's development.<sup>14</sup> However there was no characteristic of respondent had significant correlation with children developmental status. Even though, continual poverty is more harmful on cognitive ability, intelligence quotient, and other environmental factors that affect child development.<sup>15</sup>

In conclusion, there is no correlation between exclusive breastfeeding and child development status. Limitation for this study was insufficient number of respondents because it was restricted in one village area. Also, there were recalled bias because it depended on caregiver's memory to retrieve history foods eaten by child during last one year. Therefore, next research can be done using larger size sample and prospective cohort as research design.

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